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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,430	08/26/2003	Percy Vandorn Crocker JR.	083847-0200	1717
22428	7590	08/11/2004	EXAMINER	
FOLEY AND LARDNER SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			ANYA, IGWE U	
			ART UNIT	PAPER NUMBER
			2825	

DATE MAILED: 08/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/647,430

Applicant(s)

CROCKER ET AL.

Examiner

Igwe U. Anya

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-54 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 – 15, 17 – 20, 22 – 27, 29 – 36, 38 – 40, 44 – 46, 48, 49, and 51 – 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narang et al. (US Patent 6146716) in view of Mirkin et al. (US Patent 6663531).

4. Narang teaches a method of depositing a conductive coating in a desired pattern onto a substrate comprising, depositing a precursor onto the substrate in the desired pattern with use of a tip coated with the precursor (col. 11 lines 50 – 65), contacting the precursor with a ligand, and applying sufficient energy to transfer electrons from the

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ligand to the precursor, thereby decomposing the precursor to form a conductive precipitate in the desired pattern and thus forming the conductive pattern directly on the substrate (col. 5 lines 3 – 10);

wherein the pattern comprises a circuit (fig. 1), the ligand comprises a material selected from the group consisting of an amine, an amide, a phosphine, a sulfide, and an ester, the ligand is selected from the group consisting of a nitrogen donor, a sulphur donor, and a phosphorous donor (col. 6 lines 29 – 44), the precipitate comprises a metal selected from the group consisting of copper, zinc, palladium, platinum, silver, gold, cadmium, titanium, cobalt, lead, tin, silicon and germanium, and the coating comprises an electrical conducting metal with a purity of at least about 80% (col. 6 lines 39 – 40). The substrate comprises a non-conductor (col. 6 lines 35 – 40). The precursor comprises a salt selected from the group consisting of a carboxylate, a halide, a pseudohalide, and a nitrate or the precursor comprises a carboxylate (col. 6 lines 63 – 67). Applying energy comprises applying heat (col. 7 lines 17 – 21), infrared radiation or UV radiation (col. 8 lines 17 – 20). The deposition and conversion is carried out without use of an electrical bias between the tip and substrate (col. 11 lines 58 – 65). The method is used to connect at least two electrodes and conversion is a chemical conversion carried out with use of a reducing agent (col. 6 lines 29 – 36). Depositing a metallic precursor ink composition (col. 8 lines 16 – 20).

5. Narang lacks nanolithography, the tip being a nanoscopic tip, a scanning probe microscopic tip, or an atomic force microscope tip; and

the coatings comprises a metal with a thickness of less than about 10 angstroms and are separated from each other by about 100 nm or less, the deposition and conversion is carried out with use of a chemical agent other than the substrate, and the reducing agent used in the vapor state to carry out the conversion.

6. However, Mirkin et al. teach a nanolithography method, comprising a nanoscopic tip, a scanning probe microscopic tip, or an atomic force microscope tip (col. 4 lines 55 – 67). The coating comprises a metal with a thickness of less than about 10 angstroms and are separated from each other by about 100 nm or less (col. 24 lines 28 – 35). The deposition and conversion is carried out with use of a chemical agent other than the substrate (col. 6 line 30 – col. 7 line 11).

7. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Mirkin et al. into the Narang reference to obtain a finer resolution.

8. Claims 21, 28, 37, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narang et al. (US Patent 6146716) in view of Mirkin et al. (US Patent 66635311), and further in view of Rajh et al. (US Patent 6271130).

9. The Narang/Mirkin et al. reference teaches the features previously outlined, but lacks the step of decomposing comprises thermally decomposing at a temperature of less than about 300°C, applying energy as vibrational energy, and repeating the steps to form a multiplayer.

10. However, Rajh et al. teach a nanolithography method, comprising the step of thermally decomposition at a temperature of less than about 300°C (figs. 4, 5), and a

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step of applying energy as vibrational energy (col. 5 lines 19 – 62), and repeating the steps to form a multiplayer (col. 4 lines 39 – 51).

11. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Rajh et al. into the Narang/Mirkin et al. reference to control the decomposition energy, and thickness.

12. Claims 16, 41, 42, 43 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narang et al. (US Patent 6146716) in view of Mirkin et al. (US Patent 66635311), and further in view of Peeters (US Patent 6325904).

The Narang/Mirkin et al. reference teaches the features previously outlined, but lacks the step of forming a biosensor, a lithography template, a semiconductor and the reducing agent used in the vapor state.

13. However, Peeters teaches a nanoelectrode array comprising a biosensor, a nanolithography template, and a semiconductor (col. 5 line 9 – col. 10 line 43), and the reducing agent used in the vapor state (col. 5 lines 38 – 41).

14. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Peeters into the Narang/Mirkin et al. reference to fabricate a biosensor, a template and a semiconductor as common knowledge in the art

15. Prior art considered, but not used in the rejection include Schwartz (US Patent 6737646).

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16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Igwe U. Anya whose telephone number is (571) 272-1887. The examiner can normally be reached on M - F 8:30am - 5:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Igwe U. Anya  
Examiner  
Art Unit 2825

IA

August 9, 2004

  
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SUPERVISORY PATENT EXAMINER  
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